1856MNRAS..16..109J

The Observatory at San Fernando.
The University of Göttingen.
The Calcutta Public Library.
The New Orleans Academy of Sciences.
The Editor of the Athenæum Journal.
The Editor of the Literary Gazette.
The Editor of the Critic.

G. B. Airy, Esq.
Dr. Alexander.
Lieut. Ashe.
C. Babbage, Esq.
Prof. A. D. Baché.
Sir Edward Belcher.
M. Biot.
George Bishop, Esq.
W. Bollaert, Esq.
W. C. Bond, Esq.
M. F. Brünnow.
A. Caley, Esq.
Rev. T. Chevallier.
E. J. Cooper, Esq.
Prof. De Morgan.
M. De Verneuil.
Dr. Donati.
S. M. Drach, Esq.
Prof. Encke.
M. Fedorenko.
Dr. B. A. Gould.
W. Gravatt, Esq.
M. Grunert.
J. Herapath, Esq.
Rowland Hill, Esq.
J. R. Hind, Esq.
E. Hopkins, Esq.
M. K. Hornstein.
Capt. Jacob.
W. H. R. Jessop, Esq.
M. C. Kerlin.
Dr. J. Lamont.
M. Lartigue.
Dr. Lee.
M. Lindelof.
M. Mathieu.
L'Abbé Moigno.
Don C. Moesta.
M. Nobile.
M. W. Oeltzen.
J. Page, Esq.
H. Perigal, jun., Esq.
Dr. Peters.
M. Plantamour.
A. W. Price, Esq.
Prof. Quetelet.
J. Riddle, Esq.
Admiral Sir John Ross.
Signor Santini.
Capt. Shadwell.
C. K. Smith, Esq.
M. W. Struve.
M. O. Struve.
Thos. Tate, Esq.
R. Taylor, Esq.
M. Weisse.

Address delivered by the President, Manuel J. Johnson, Esq. M.A., on presenting the Gold Medal of the Society to Mr. Grant.

I rise, Gentlemen, according to custom, to say a few words on the subject of the Medal which, as you have heard, your Council has this year awarded to Mr. Robert Grant, for his book entitled *A History of Physical Astronomy*,—an award so far remarkable, that it is the first which, during the Society's thirty-six years' existence, has been conferred on literary service.

No one, I am sure, who has looked into this book will dispute its merits, or its high claims to the Society's notice. The only

1856MNRAS..16..109J

question that can be raised is, whether it comes within the sphere of that kind of approval which your Council has thought fit to express; whether, in fact, this bestowal of the Medal is not a departure from the traditions of the Society, which has hitherto confined the distinction to services technically astronomical in theory or practice.

A reference to our bye-laws, however, will, I believe, immediately dispel such objections. Therein your Council is enjoined to make its award in favour of whatever work shall appear to it most conducive to promote those ends for which the Society was established; and whether our Founders contemplated such an award as the present or not, certain it is they placed no restriction on the action of their successors. Our Founders were men of large experience; they knew the inexpediency of binding down one generation to the maxims of another. They knew how variable were the phases of human institutions and of human pursuits, and how ephemeral circumstances must regulate the conduct of public bodies.

However, Gentlemen, I cannot believe that our Founders ever thought of excluding literature from this most emphatic expression of your gratitude and respect. Can we suppose such a thought to have entered the minds of Baily or of Colebrooke, men eminent for their knowledge in this department of our subject? We are hardly left to conjecture. Time, it is true, has thinned the ranks of those who participated in the early struggles and triumphs of the Society. However, happily there are still among us men who, if not to be classed among our founders, were among our earliest and staunchest supporters, and whose congeniality of mind with our founders we know from the intimacy which once united them. Gentlemen, we are still proud of our Herschel, our Airy, our Smyth, and our De Morgan, whose sentiments we know. Would I could add to this list, endeared to us by many associations, another name,—that of Richard Sheepshanks, whose face and form only a few short months ago were so familiar to us all, whose sentiments, too, we know as well as if he were still among us. No, Gentlemen, it has not been from any depreciation of the value of literature, or of the accomplishments required for its successful prosecution, or of the direct practical assistance it renders to the astronomer in the closet and in the observatory, that hitherto you have made no award in its favour, but simply because you have not had an opportunity of doing so.

It seems, at first sight, strange, that in a subject like astronomy, of which the ramifications are so wide, such should be the case; but I believe it is in this very circumstance that we find an explanation of the deficiency. The materials for history are so abundant, and the labour of research is consequently so appalling, that, to say nothing of the rare mental qualifications which the task demands, there are few men who have the leisure or courage to encounter it. Then it happens in scientific as in civil history, that during particular periods, its events cluster

1856MNRAS..16..109J

round certain individuals, who thus offer themselves as appropriate subjects for special histories. Accordingly, we find the great mass of astronomical history written in the form of biographies, which, however instructive, must be incomplete, and therefore, seldom calculated to produce that influence on science which is the great object of general history.

Except the work before us, I know of no other which has appeared in our own day approaching the character of a general history, though only for a short period, but Mr. Airy's Report on Astronomy to the British Association in 1832,—a document containing a fund of information, and exhibiting an amount of reading, research, and thought, very inadequately represented by the number of pages within which it is compressed. In an assembly such as I have the honour to address, it is needless to dwell on the direct benefits which flow from works of this kind. They are the maps of knowledge; they show the sources of those mighty streams which irrigate the plain of human civilisation; they show the barriers which obstruct their course; they show where human skill and perseverance have opened channels which Nature seemed to deny. They mark the boundaries of the garden and of the wilderness,—the waste land which Science has been permitted to reclaim, and that whereon man, in humble dependence on his Maker, may still toil with industry and hope. Gentlemen, I must apologise for intruding reflections which will have suggested themselves to you much more forcibly than any language of mine can convey. I was going to say, that if illustration were wanting of the practical influence of such works, I know of none to which I could appeal more confidently than to that Report of the Astronomer Royal. There you will find a concise statement of the weak points of our science, both theoretical and practical, and a bold enumeration of the defects of English astronomy at the time it was written. If called upon now for a similar contribution, the author would have much to modify on the latter score; but as he has been himself the principal corrector of the evils which he exposed, exception may be made to this illustration. However, there was one important subject mentioned in that Report to which especial attention was called,—viz. the anomalies in the orbit of *Uranus;* and we have, as you know, Mr. Adams's own authority for saying that it was this passage which first called his attention to the subject, and thus it has been a means of securing to England a large share in one of the greatest astronomical discoveries of any time.

It is not only in our own, but in European literature generally, that there is this scarcity of comprehensive histories of astronomy. There are many partial histories, such as those by Cassini, Bouillaud, Weidler, Riccioli, Costard, Lalande, Narrien, and others; but the only work, of which I am aware, at all comparable with that before us in scope and treatment is *L'Histoire de l'Astronomie Moderne* of Bailly, whose tragic end forms so strong a contrast to the philosophic dignity of his early career. This work, contained in three quarto volumes, treats of the history of astronomy from the foundation of the school of Alexandria to the year 1781,

1856MNRAS..16..109J

about the time when Laplace had established his reputation as a geometer, and was entering on that course of brilliant investigations which has rendered his name illustrious. The pupil of Clairaut, whose portrait he has drawn in a very fine passage of his *History*, Bailly may be said to have been contemporary with the first developments of the Newtonian philosophy,—in which, indeed, he took a part by his investigations of the theory of *Jupiter's* satellites. A scholar, a geometer, an astronomer by taste, a most eloquent writer, and an unaffected philosopher, he possessed many essential qualifications for an historian; and his book will always hold its place, not only for the information it contains, but as a model of style and temper. Bailly, however, had a double object in view; he wrote for the educated public as well as for astronomers, therefore he was necessarily less critical than he would otherwise have been. This work is, I believe, generally accompanied by two other volumes, *L'Astronomie Ancienne* and *L'Astronomie Indienne*, in which some whimsical views are propounded touching an antediluvian people, from whom he supposed we derived our astronomical knowledge; "who," as Delambre wittily observes, "told us everything but their name and where they lived."

These views, however, which really occupy but few passages in the works in which they appear, are not obtruded at all in *L'Astronomie Moderne*, where I have seen nothing inconsistent with the most sober judgment. Bailly's work, as I have said, terminates with 1781. In 1810, a very carefully-written continuation of it was published by Voiron, giving a concise account of the discoveries of Lagrange and Laplace up to that time.

Delambre's well-known history (the first volume of which appeared in 1817) is of another kind: it is rather a history of the astronomical processes for investigating the movements of the celestial bodies, than of the theory of gravitation. He devotes a section in his last volume (a posthumous publication, which appeared in 1827) to Newton; no more, however, than incidental mention is made of such men as Euler, D'Alembert, or Clairaut. His taste led him to practical astronomy in its most comprehensive sense, by which I mean not so much the manipulation of instruments as processes. Calculation was his delight, and the application of theory to practice. No one will dispute the immense value of a work containing the vast amount of information which this does on almost all astronomical subjects, or deny the service its author has rendered to his favourite science.

I have mentioned, I believe, the only works which had any claim to be styled standard histories in either branch of astronomy at the time Mr. Grant's book appeared, and they were becoming antiquated.

Fortunately it so happened that in 1847, just twenty years after the appearance of Delambre's last volume, Mr. Baldwin, a gentleman whose name must always be mentioned with honour in every assembly of educated Englishmen, as the enterprising publisher of that series of works known as the Library of Useful

1856MNRAS..16..109J

Knowledge—which, more than any other, was the means of rousing public attention to the importance of scientific studies—in 1847, Mr. Baldwin being engaged in publishing a continuation of the series I have mentioned, Mr. Grant, then a young man, almost unknown to the scientific society of London, proposed to write for him a short history of Physical Astronomy. The proposal was accepted, and the first number of the book appeared in September 1848.

At that time Mr. Grant was not connected with this Society, and it was not until the year following that, through the kind offices of Mr. Woodfall, of the well-known house of George Woodfall and Co., printers, he obtained an introduction to your Secretary, Admiral Manners, an event which he remembers with gratitude, and speaks of as having made his course smooth. Until that time his access to books of reference of very recent date had been often troublesome and precarious. The History was finally completed, and published in the spring of 1852.

It would be quite out of the question on this occasion to attempt a detailed criticism of a work like that before us, and yet you have a right to expect from me such a sketch of its contents as may enable you to form some judgment on the propriety of your Council's award. This I will proceed to give as briefly as I can.

The first thirteen chapters of the book are devoted to an Historical Exposition of the Theory of Gravitation, from Newton's first conceptions, through the gradual developments it has undergone at the hands of Euler, Clairaut, D'Alembert, Lagrange, Laplace, Poisson, Plana, Airy, Lubbock, Hansen, and others, till the last great achievement of Adams and Le Verrier. This inquiry forms by far the most laborious portion of the volume. To collect his materials, the author had not only to wade through the pages of a multitude of special treatises, but also to search the published records of all the great Academies of Europe. Then the arrangement, in anything like lucid order, of the vast mass which he had accumulated in the narrow compass of an octavo volume, was no slight difficulty; and if we further consider that his facts were to be stated in language which was to satisfy the mathematician, and to be intelligible to the educated public, I think it admits of question whether the task of construction was not as great as that of collection and discussion.

In this part of the book he carries us through the theory of planetary perturbations as gradually developed by Euler, Lagrange, Laplace, and Poisson, showing at each step how much each accomplished, and where each failed. He gives a complete account of the researches of Lagrange and Laplace which demonstrated the stability of the planetary system; of the acceleration of the moon's mean motion, from its detection by Halley to the discovery of its cause by Laplace; of the theory of *Jupiter's* satellites; and of the discovery of the planet *Neptune*.

This, though the most laborious, does not constitute the largest portion of the volume. All that is known of the phy-

1856MNRAS..16..109J

sical constitution of sun, planets, and comets, is given in great detail in the fourteenth and fifteenth chapters, together with many valuable contributions to the literature of those subjects. Nor has the author omitted to trace the history of observational astronomy from the earliest period to the present time; or to acquaint his readers with those grand views touching the structure of the heavens, of which Wright, of Durham, appears to have been the original propounder, and to which the genius of William Herschel and William Struve has since given importance.

This, Gentlemen, is a very rapid, and I confess a very inadequate statement of the contents of a book, of which the best praise is, that it has satisfied those who have had occasion to refer to it. For myself, I do not profess to have examined it rigorously, though of course during the last few weeks it has been my duty to look through it very carefully. I confess to have been astonished at the clearness and the completeness with which in so small a compass he has conveyed so much information. There is only one point where he appears, in my opinion, to have fallen short;—he has not given sufficient prominence to the labours of the illustrious author of *Theoria Motûs Corporum Cœlestium*—an oversight occasioned, as I afterwards found, by a difficulty in arrangement which could not be easily obviated.

Throughout the book no one can fail to be struck with the rare skill, integrity, and discernment, the author has displayed in tracing the successive stages of progress; or with the scrupulous care he has taken to assign to each of the great men whom he reviews, their proper share in the common labour. Nowhere is this more conspicuous than in the discussion relative to the discovery of the planet *Neptune*. By a simple narration of facts, he has placed the history of that great event in so clear and so true a light that I believe I am not wrong in saying, he has gained an author's highest praise under such circumstances—the approval of both the eminent persons concerned.

The same spirit of candour and fairness pervades every page. Everywhere you will find that delicacy and consideration for other men's reputations, which are characteristic of a liberal mind. I will assert without fear of contradiction, that there is not a flippant or inconsiderate passage—not *one* calculated to wound unjustly the memory of the dead, or the feelings of the living; no offensive nationality seeking to pervert truth under the garb of patriotism.

At the same time, with all this disposition to render deference and respect, you will find no connivance with undue assumption.

Thus he vindicates for Euler the first conception of the theory of the variation of arbitrary constants: frequently ascribed to Lagrange.

He claims for Picard, against Dominique Cassini, the discovery of the effect of temperature on atmospheric refraction.

He has justly assigned to Tycho Brahé and Thaddeus Hagech (better known as Hagecius) the invention of the method for

1856MNRAS..16..109J

determining the place of a celestial body by meridian observations, —an invention which has been referred on high authority to the astronomers of the seventeenth century.

He shows that the Method of Equal Altitudes, which has been attributed to Picard, is really due to Thomas Digges, who published it as early as 1573.

He defends Roemer, the inventor of the Transit Instrument, against a most unjust insinuation, tending to deprive him of the merit of that invention.

I could cite other passages of the same kind, but these are enough to show how deep and independent have been our author's researches.

It is, then, for this book, as a great and important contribution to our literature, solely on its own intrinsic merits, irrespective of every consideration of the circumstances under which it was produced, that your Council has resolved to award to Mr. Robert Grant your Gold Medal, as the highest tribute they can pay to his indefatigable zeal and talent, and of appreciation for the service he has rendered. I hope this act of your Council will meet with your approval.

The President then delivering the Medal to Mr. Grant, addressed him in the following terms:—

Mr. Grant,—In the name of the Royal Astronomical Society I have the honour to present to you this Medal, as the highest tribute it can pay to the ability, the learning, and the industry you have displayed in your work entitled *A History of Physical Astronomy*, and as an acknowledgment of the great service you have thereby rendered to our science.

I am sure every Fellow of this Society will unite with me in warmest wishes that your health may be long spared to reap fresh honour in the great field of research which you have chosen, accompanied by more substantial rewards than it is in our power to confer.

The Society is probably not aware of some of the circumstances of your early life, and I have purposely abstained from mentioning them in my address, lest I should seem to wish, by such means, to influence their judgment on the resolution of the Council; otherwise, Sir, I might have dwelt on the dispensation of Providence which incapacitated you, in the bloom of promising boyhood, for exerting those faculties which you most value. I could have said, that during those six precious years of life—from fourteen to twenty —when most men are preparing for the active duties of life, you were laid on a bed of sickness—that with the unexpected return of bodily strength, the mind, too, began to yearn for nourishment —that you became your own instructor, and, with no other help than books, supplied by the affectionate care of your relatives, you qualified yourself for the high task you have now so successfully accomplished. I could have said more, but these, Sir,

1856MNRAS..16..116.

are incidents which, though they enhance our interest in your book and our respect for you, did not, as I have said, influence the members of the Council, to most of whom, I believe, the incidents were unknown. They certainly have not influenced the Society to-day. This award is a deliberate expression of the high opinion we entertain of the value of your book as a contribution to the scientific literature of your country, and as such we beg you will accept it.

The Meeting then proceeded to the election of the Officers and Council for the ensuing year, when the following Fellows were elected:—

President:

MANUEL J. JOHNSON, Esq., M.A. Radcliffe Observer.

Vice-Presidents:

G. B. AIRY, Esq. M.A. F.R.S. Astronomer Royal.
AUGUSTUS DE MORGAN, Esq.
Rev. ROBERT MAIN, M.A.
Rev. BADEN POWELL, M.A. F.R.S.

Treasurer:

GEORGE BISHOP, Esq. F.R.S.

Secretaries:

WARREN DE LA RUE, Esq. F.R.S.
Admiral R. H. MANNERS.

Foreign Secretary:

JOHN RUSSELL HIND, Esq. Superintendent of the Nautical Almanac.

Council:

RICHARD C. CARRINGTON, Esq.
Rev. GEORGE FISHER, M.A. F.R.S.
JAMES GLAISHER, Esq. F.R.S.
ROBERT GRANT, Esq. M.A.
JOHN LEE, Esq. LL.D. F.R.S.
Rev. C. PRITCHARD, F.R.S.
WILLIAM RUTHERFORD, Esq. LL.D.
WILLIAM SIMMS, Esq. F.R.S.
Admiral W. H. SMYTH, K.S.F. D.C.L. F.R.S.
S. C. WHITBREAD, Esq., F.R.S.

London:—Printed by G. BARCLAY, Castle St. Leicester Sq. and Published at the Apartments of the Society, March 11, 1856.